Exhibit 26

In The Matter Of:

Honeywell International Inc., et al. v.
Hamilton Sundstrand

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kind of a pictorial view of the surge control system.

So we have here identified figure 13 as the surge control unit. And we identify the controller as a PI D controller.

Now, PI D, the D part is derivative action, it's a third mode of the controller. And whenever I'm controlling flow, I know I cannot use derivative. It is not beneficial to the action of a flow controller, so it's always set to zero, in which case the PI D controller reduces to a PI controller.

Q: Does a PI D controller include the functions of a PI controller?

A: Yes, the PI D controller has all the functions of the PI controller plus the derivative action if one chooses to use it.

Q: Now, Mr. Kempe's article doesn't discuss using electronic control for the surge control system?

A: No, it doesn't.

Q: By the time of the year before the Honeywell patent applications were filed, would that be something that would be known to an

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engineer of ordinary skill in this field?

A: Yes, in 1963 when this article was published, electronic control was in its infancy. And not all of the components that are required in a surge control system would be available implemented electronically, but by the 1970's, there was a complete line of components available.

And people who were skilled in the art would recognize that electronic control was faster and more accurate than pneumatic control. So by the early '70's, all surge control systems were implemented electronically.

Q: Let's go to the page 16, which I think is the third page in.

Does Kempe's article discuss generally the importance in a surge control system of matching the set point with the surge line?

A: Yes, he does. I think we have to go back to page one to find that Excuse me. In fact, it's the next page after this.

Yes, let me blowup this section here. Kempe says, "For economic reasons it is important to keep the blow-off limit as near to

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the surge limit as possible, in other words to match the response curve of the surge control device with the surge characteristic."

Q: Now, Mr. Shinskey, stepping back, looking at all these features that Kempe dispose, as adjusting the set point using guide vane position, using proportional integral controls, a flow-rated parameter that's independent of temperature, does the information that he provides give enough disclosure so that an engineer of ordinary ability in the field would be able to take what he's showing and actually implement it in a surge control system?

A: Yes, definitely.

Q: All right. Why don't we turn to our next article, and that's Defendant's Exhibit 147, the Warnock article.

THE COURT: Before you do that, let me pole the jury here. I misspoke earlier when I said that we were going to be on our normal schedule today.

Ms. Preston advises me that I have a meeting at 12 noon which leads to me to ask whether you would like to take a morning break or

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work straight through until noon. We would break from 12:00 until 1:15.

Do you want to stay and work straight through to 12:00?

THE JURY: A short break.

THE COURT: Why don't we take a short ten-minute break right now. Okay.

(A brief recess was taken.)

THE COURT: Mr. Shinskey, take a seat, please.

(Jury entering the courtroom at 11:15 a.m.)

THE COURT: All right. We'll continue. And we're going until noon and break until 1:15.

BY MR. HERRINGTON:

Q: I think we left off with the Warnock article, Defendant's Exhibit 147.

Mr. Shinskey, could I ask you to tell us the name of this article?

A: Typical Compressor Control Configurations.

Q: And the author?

A: Y.D Warnock.

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Q: Is — are you familiar with Mr. Warnock?

A: Yes, I am.

Q: Who is he — who was he?

A: He was an application engineer at Warnock Products Company, which is a competitor of my company. He held a position within his company similar to what I held in my company.

Q: Was he a controls engineer?

A: Yes.

Q: Why don't we look at the top left corner, I believe that shows a date. If you could please explain what that reflects?

A: Yes. This is copyright 1976, I.S.A. I.S.A. Is the Instrument Society of America. And A.C. is their annual conference which would have been held in 1976.

This article would be a print from their proceedings of that conference.

Q: And if you could, please, just describe who attends an annual conference of the Instrument Society of America?

A: The I.S.A. is a professional society which fosters the development of technology in measurement and control systems applied to a

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variety of industries.

They have representatives from — in fact, they have divisions for the petroleum chemical industries, pulp and paper, aerospace, automotive, biomedical and so forth, and control and instrument engineers from all of those industries will attend their annual conferences.

Q: What's the purpose of a paper that's being delivered at this annual conference?

A: The paper delivered at this conference would be used by the presenter to show his findings, his results, the technology that was developed in his company to the rest of the membership, so that they would be able to benefit by and possibly use the technology presented in the paper.

Q: Before we discuss what the contents of this article, was this article something that the patent examiner had when he was considering the validity of the Honeywell patents?

A: I did not see this among the references that the examiner cited, no.

Q: Now, generally what is the subject of this article?

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A: Well, in this article, Warnock tries to cover the whole universe of compressor control configurations regardless of the demands or the applications of compressors. And therefore, he shows many, many different systems, which apply to different applications.

Q: Does he discuss compressors with adjustable inlet guide vanes?

A: Yes, he does.

[10] Q: And where is that?

[11] A: He describes adjustable inlet guide vanes [12] in one of the later pages, it's figure 15, and [13] there is text associated with figure 15.

[14] Q: I don't know if I've said yet, I believe [15] this is at Tab P in the jury book.

[16] A: His figure 15 shows, in fact, a [17] compressor with a guide vane operator, as you can [18] see. The guide vane operator is right here. And [19] the guide vane operator happens to be driven by a [20] pressure controller.

[21] Then he shows a function block here [22] where the position of the guide vanes is used to [23] adjust the set point for the surge flow [24] controller.

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[1] There is the set point and a surge [2] controller is identified here.

[3] Q: Is he depicting the adjustment of the set [4] point based on inlet guide vane position?

[5] A: Yes, he is. In essentially the same [6] manner as the patents, the position of the guide [7] vane signal goes through a function block, [8] converted into an equivalent flow of set point.

[9] Q: You mentioned that he also in his text is [10] describing this figure. Where is that?

[11] A: That appears on the page of the text that [12] begins with the description of what's happening in [13] figure 15.

[14] And I'll read the text, it says [15] "When changes in guide vane position introduce a [16] pronounced difference between the actual surge [17] line and the surge control line defined by a [18] particular surge control system, accuracy, in [19] fact, this is an important word, " the accuracy of [20] the surge control can be improved by entering the [21] guide vane position into the system for [22] compensation."

[23] And then he goes on to describe how [24] figure 15 shows a flow surge control system with a

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[1] set point generated by the guide vane loading [2] signal.

[3] Q: And what does that mean?

[4] A: Well, that means that the guide vane [5] position signal is characterized into a [6] corresponding set point change, so that the system [7] will be operated efficiently as possible, but [8] still kept out of surge for all the various [9] positions of the guide vanes.

[10] And he shows that this can be done [11] by straight line approximation or by a nonlinear [12] characterizing device and he's describing the [13] functional relationship between the guide vane [14] position and the set point.

[15] Q: Does Mr. Warnock's article have any [16] explanation or any figures explaining use to [17] adjust the set point based on inlet guide vane [18] position?

[19] A: Yes, if we can go back to the previous [20] page, I think figure 14, in fact, shows the [21] relationship.

[22] Yes, in figure 14, he relates, he [23] relates the flow meter differential pressure [24] measurement to the guide vane position, that each

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[1] one of these points that appear on the — each one [2] of the points that appear on the graph represents [3] a surge point.

[4] And he shows how the surge point [5] will move as the guide vanes are moved, and [6] therefore we have to develop a control system that [7] has a surge control line, that is where we're [8] controlling flow on the safe side of the surge [9] points for all various guide vane positions.

[10] And he list them all from 70 degrees [11] rotation to zero.

[12] Q: And then he shows a surge control system [13] that adjusts the set point based on guide vane [14] position?

[15] A: Yes, he essentially is implementing the [16] function in figure 15, which we've already seen.

[17] Q: All right. Now, you talked about how the [18] Honeywell patent claims refer to the use of [19] proportional integral controls. What type of [20] controls does Mr. Warnock's article recommend for [21] a surge control system?

[22] A: Warnock specifies proportional plus [23] integral control. And that appears if you go back [24] to the text just under the heading figure 15, we

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[1] go to the next piece of text over here. And so [2] he's talking about the surge controller as can be [3] seen at the very top, the heading is Surge [4] Control, then he talks about reset and describes a [5] proportional plus reset controller as his surge [6] controller.

[7] And "reset" is another word for [8] " integral". That was the word — the word [9] "reset" was developed earlier in the technology [10] and later it was identified as an integral mode, [11] so reset is very common used in industry.

[12] Then he goes on to describe how the [13] reset access is in the controller, then we can run [14] into a problem called " reset windup". And he goes [15] into disclosing how the controller can be [16] protected against this reset windup problem and so [17] you can see proportional and integral are part of [18] his scheme.

[19] Q: Does Warnock also discuss measuring a [20] flow-related parameter?

[21] A: Yes, of course he does. If we could look [22] at figure 6(a).

[23] In figure 6(a), he shows a flow [24] measurement made on the discharge of the

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[1] compressor, so we have discharge flow. Then [2] pressure measurement also made on the discharge to [3] the compressor. And then he shows a divider where [4] we divide one by the other.

[5] And in this case, his example shows [6] pressure divided by the differential pressure [7] across the flow meter. This is the inverse of the [8] flow-related parameter which is described in the [9] patents, however in this case the text Warnock [10] goes on to point out that we can calculate this [11] either as the pressure divided by the differential [12] pressure or as the inverse. This is a purely [13] arbitrary function. You can do it either one-way [14] or the other way. And either way produces the [15] same result.

[16] This is in essence the flow-related [17] parameter of the patents, and if the flow-related [18] parameter of the patents is independent of [19] temperature, then this flow-related parameter is [20] as well.

[21] Q: When you say here the flow-related [22] parameter of the patents, you're talking about [23] what?

[24] A: The flow-related parameter of the patents

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[1] is PT minus PS over PT. The function that is [2] calculated in figure 6(a) is the inverse of that [3] parameter. But as I said in the text, Warnock [4] describes that it can be calculated either in this [5] way or as the inverse, either way produces the [6] same result.

[7] Q: Let's look at figure 15 for just a [8] moment.

[9] Now, in figure 15, Mr. Warnock is [10] showing measuring a flow parameter on the inlet [11] side of the compressor?

[12] A: Yes, he does.

[13] Q: Does he also discuss how that measurement [14] can be taken on the discharge side?

[15] A: He does. There is a section of this [16] paper where he discusses this relationship between [17] inlet and outlet flow measurements. And so one [18] can be replaced with the other, if compensation —[19] and sometimes, compensation isn't even necessary, [20] especially in constant speed compressors.

[21] Q: Now, some of the Honeywell patent claims [22] talk about using electronic

controls. Does Warnock refer to using electronic equipment in the surge control system?

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A: Yes, he does. I believe this is — this text follows the discussion on the reset windup protection. If we could go back to the text that has —

Q: I think it's page 12.

A: Yes. Right at the very top, the first full paragraph at the top talks about, he has developed this method or described this method for protecting the proportional plus reset controller against windup. That method is — he names the batch switch.

And so he says, "The batch switch system is available on a number of pneumatic controllers as an option, and a number of electronic controllers as a standard feature."

So he does address electronic surge control systems.

Q: Now, looking back at the, Mr. Warnock's introduction to his article on the first page, does he discuss the importance of matching a set point of a surge control system with where the surge point would be?

A: Yes, I believe he does. I think it's over here.

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Now, he addresses here, and this is quite important, he addresses the economy of the system. And he says since bypassing or blowing off gas waste power, it's desirable to determine surge flow as accurately as possible to avoid bypassing while maintaining safe operation.

However, he says, this is not a simple matter. Surge flow for compressors is not a fixed quantity, but is related to other variables. And I'm going to underline here other variables.

And among those variables, of course, would be inlet guide vanes. And speedy and so forth. And so where other variables substantially affect surge flow, they must be measured and included in the surge system, and that's the role of inlet guide vanes when they were variable.

He goes on to say, surge conditions can be defined completely in terms of variables other than flow. But the problem of defining surge conditions has led to the development of a wide variety of systems.

And of course he shows many examples

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of those systems in his paper.

Q: I believe you already reviewed one of the examples he shows is when a compressor has adjustable guide vanes that the set point should be adjusted based on the guide vane position?

MR. PUTNAM: Objection, leading.

THE COURT: Why don't you rephrase it.

Q: With respect to compressors that have adjustable guide vanes, what does Mr. Warnock show?

A: Mr. Warnock's conclusion with adjustable guide vanes, he uses the adjustable guide vanes to set the set point of the surge controller and therefore compensate for the guide vanes in their affect on the location of the surge limit.

Q: Now, Mr. Shinskey, we've talked about Warnock disclosing data of the set point based on inlet guide vane position, his reference to using a flow-related parameter that would be to temperature, to using, would an engineer of ordinary skill read this article back in the late 1970's be able to take what Warnock is describing and implement it in a surge control system?

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A: Yes, he could.

Q: Why don't we turn to the White article, that's Defendant's Exhibit 6. This is Tab N in the jury book.

Mr. Shinskey, if you could, please, tell us the title of the article?

A: Surge Control for Centrifugal Compressors.

Q: Do you recognize the author?

A: Yes, the author, M.H. White was a member of the Foxboro Company at the same time I was, and at the time the article was prepared.

Q: And if you could, please, tell us the journal in which this article was published?

A: This article appeared in Chemical Engineering magazine. Chemical Engineering magazine, a technical magazine which serves the chemical industry and the light industries, different — wherever chemical technology is used, and food processing, paper mills, hydrocarbons and so forth, Chemical Engineering magazine is used.

And it also includes technical articles on controlling those processes in all of those industries.

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Q: And are you familiar with generally the circulation of this journal?

A: It would be over 100,000, I would believe. I have subscribed to Chemical Engineering magazine for almost 50 years and some of my articles have appeared in here as well.

Q: Now, this particular article by Mr. White, has this been cited in other publications?

A: Yes, in fact, Warnock does include White as a reference in his article. And it is — this article that he published here was — has been used at the Foxboro Company as kind of a standard for engineers in the work that they have done in designing surge control for compressor.

Q: I don't know if you mentioned yet, what is the date of this article?

A: December 25th, 1972.

Q: That was before the that was before the patents were applied for?

A: Yes.

Q: You reviewed the file wrapper for the Honeywell patents. Was this article examined by the patent office when they were considering the

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validity of the Honeywell patents?

A: It is not among their references, no.

Q: What is the subject of Mr. White's article?

A: Mr. White is trying to show engineers how to design an efficient and safe surge control system, again, for a variety of different compressors.

Q: Does he discuss surge control for compressors that have adjustable inlet guide vanes?

A: Yes, he does.

Q: Where is that?

A: That's about four or five pages into the paper.

Yes, here it is. Inlet guide vanes shown here. And he talks about constant speed compressors which is, of course, the case in the patent.

Q: Let me just interrupt for a second. That's page 60 of his article?

A: Page 60.

Q: Okay.

A: Constant speed centrifugal and axial

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compressors being frequently equipped with adjustable inlet guide vanes. So it appears right here.

And then he talks about addition reply, axial compressors may have adjustable stator blade, so he puts the stator blades of an axial compressor into the same category inlet guide vanes of a centrifugal compressor.

He describes beside influencing the

system match the surge line in order to economize the operation of the system.

Is there any discussion of that in the Shell patent?

A: There is, on page 1, column 1, line 27, begins with "Since the bypassing or blow off of gas through the bypass or the blow-off line represents a loss, in any case a loss of power, the valve is only open when and insofar as it is necessary to avoid surging."

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Q: Now, as we discussed, the patent office found that the Shell patent proposed proportional and integral controls?

A: Yes.

Q: For a surge control system?

A: Yes.

Q: Have you had an opportunity whether or not Shell does disclose that. It appears in figure two of the patent there is some text that describes it as well.

A: It's on page 2, and it's at the last paragraph on the first column of page 2.

Q: Okay. Thank you.

Going back to what we just read about what Shell says about keeping the — opening the bypass valve only when and insofar as it is necessary to avoid surging, how, if at all, does that relate to adjusting the set point based on guide vane position when a compressor has adjustable guide vanes?

A: Well, if — we know that as the guide vanes are moved the flow at which surge develops changes in accordance with the position of the guide vanes.

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And since the Shell patent states the importance of the economy of the compressor to open the blow-off or bypass valve only when and insofar as necessary to avoid surging, then we see that if we didn't change the set point when the guide vanes are moved, then we will be — to protect the compressors against all possible surge conditions, then we must be venting or blowing off compressed air unnecessarily at lower guide vane positions.

Q: And does that translate into a motivation to use adjusting the set point based on guide vane position when a compressor has adjustable guide vanes?

A: That is definitely an economical motivation, yes.

Q: All right. Let me turn to what we call the Glennon patent, the '035 patent, that's Defendant's Exhibit 142.

Let me just ask you, Mr. Shinskey, if I could, identify the title of this patent?

A: Surge Control for Variable Speed Variable Geometry Compressors.

The connotation "variable geometry"

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refers to adjustable guide vanes.

Q: This is Tab U in the jury book.

THE JUROR: Tab what?

MR. HERRINGTON: U.

BY MR. HERRINGTON:

Q: And if you could, please, identify the person to whom this patent was issued and the assignee of the patent?

A: The inventors are Timothy Gleeson, Theodore Sarphine, I believe, and it's assigned to the Sundstrand Corporation.

Q: I believe you may have misspoken. Is it Timothy Glennon?

A: Glennon, I'm sorry.

Q: And the assignee is?

A: Sundstrand Corporation.

Q: And if you could, please, identify what date this application for a patent was filed?

A: It was filed on September 14th, 1977.

Q: And when was the patent issued?

A: Issued August 7th, 1979.

Q: Now, does the Glennon patent contain a discussion of adjusting the set point based on inlet guide vane position?

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A: Yes, it does. We'll have to move in to about the third or fourth — well, the next figure, or what is figure one on the next page shows the motivation for adjusting.

Here we have — some of the things we've seen before where the surge line varies with the position of guide vanes. And in this position, Glennon covers variable speed as well as variable guide vanes.

And so Glennon shows that as the guide vanes are changed from fully opened to fully closed, the surge point moves following the contour of the surge line.

And, therefore, it would be desirable to move the set point of the surge controller commensurate with the movement of the surge point.

Q: Is that shown in the Glennon patent as well?

A: The implementation is shown in the Glennon patent, yes. It's perhaps two or three more figures after this.

This is the one, yes. Here we have the IGV position is indicated here. The IGV

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position is measured and then it goes through what's called a describing function.

The describing function is essentially the functionality that we see in the other patents relating or converting the position of the guide vane into a signal representing the corresponding flow as a set point for the controller.

And this is sent on to the comparator, which you'll see right here and in that way performs essentially the same role in the Glennon patent as we have seen guide vane positions in both the prior art and in the Honeywell patents.

Q: All right. Let me ask you about another Glennon patent that's Defendant's Exhibit 143. This is Tab V in the jury book.

And let me just maybe to move this through this a little more quickly. This is also a patent issued to Glennon and others and assigned to the Sundstrand Corporation?

A: That's correct.

Q: And the application date is September 14th, 1977, and this patent was issued on August

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7th, 1979?

A: That's correct.

Q: And does this patent also have a discussion of adjusting the set point based on guide vane position?

A: Yes, it does.

Q: Maybe just quickly identify the figures where that is?

A: Figure one again is very similar to the figure one in the previous patent. And shows a similar relationship to the position of the guide vanes and the surge point plotted in flow versus compression ratio.

Q: And then is there another figure actually shown?

A: Yes, there is another figure. And this figure shows more complex calculation than in the previous patent, but it also shows as well this input signal here, inlet guide vane and/or speed information, if employed.

So it shows the capability for bringing inlet guide vane position into the set point of the surge controller and again, the comparator appears right here, that's the same

generator [22] coupled in series between the inlet guide vanes [23] and said input portion of said comparator."

[24] Mr. Shinskey, is that element

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[1] satisfied in the APS 3200?

[2] **A:** No, it's not. The guide vane position [3] signal does not — is not connected either through [4] a function generator or any other way coupled in [5] series between the guide vanes and in the input of [6] the comparator of said comparator in the APS 3200.

[7] **Q:** Can you show chart 32, please.

[8] When we read element C of Claim 19, [9] which said, "An adjustable set point comparator [10] having an input portion coupled to said output [11] portion of said sensing device, and an outlet [12] adapted to generate an error signal."

[13] Can you identify where that would be [14] in the APS 3200?

[15] **A:** Again, the comparator is this circle [16] here, which receives a set point as an input, [17] which receives the DELPQP surge variable as [18] another input and generates an error signal which [19] is output to the P and I controller.

[20] **Q:** And in element G of claim 19 states, [21] "Guide vane position sensor and a function [22] generator couple in series between the inlet guide [23] vanes in said input portion of said comparator."

[24] Is that present in the APS 3200?

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[1] **A:** No, it's not present.

[2] **Q:** If you could explain why that's not so?

[3] **A:** The set point which is set to 2 [4] comparator in the APS 3200 is generated as a [5] function of temperature and not guide vane [6] position. So it substitutes for the role of guide [7] vane position in the APS 3200, essentially [8] replaces guide vane position as an input.

[9] **Q:** Now, is the APS 3200 in using inlet guide [10] vane position in another part of its control [11] logic, is that equivalent to what claim 19 (g) [12] requires in stating that a guide vane position [13] sensor and a function generator coupled in series [14] between the inlet guide vanes and input portion of [15] said guide vane comparator?

[16] **A:** No, the guide vane portion is not [17] connected.

[18] **Q:** Looking at element G, what is the [19] function in the patent claim of having a guide [20] vane position sensor and a function generator [21] coupled in series between the inlet guide vanes [22] and the input portion of said comparator?

[23] **A:** The function is to change the set point [24] of the flow-related parameter as inlet guide vane

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[1] position changes in the patent.

[2] **Q:** And again, is that function performed in [3] the APS 3200 by inlet guide vane position?

[4] **A:** No, it's not performed by inlet guide [5] vane position. It is performed by temperature, [6] however.

[7] **Q:** Can you compare in terms of way and [8] result what element G requires and what the APS [9] 3200 actually does?

[10] **A:** The way this operates is in the patent is [11] to send the guide vane position signal through a [12] function generator which produces a relationship [13] between the set point of the surge controller, [14] which is the desired value of flow and the [15] temperature.

[16] In the case of the — excuse me, in [17] the patent, the relationship is between the set [18] point of the surge controller and the guide vane [19] position. In the APS 3200, the guide vane [20] position instead is used in such a way as to [21] disconnect the PI controller from the bleed valve.

[22] **Q:** Now, I believe Mr. Muller in arguing that [23] element G was satisfied in the APS 3200 pointed to [24] something that he said was a comparator, and it

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[1] was different than what he had pointed to as [2] satisfying element C.

[3] In your understanding, is that a [4] fair reading of the function that's required by [5] element G of Claim 19?

[6] **A:** No. I would say it's not a fair reading [7] because element G requires the connection to the [8] said input portion of said comparator, and [9] Mr. Muller pointed to a different device on [10] another diagram which was not even a comparator.

[11] **Q:** Why don't we turn to Claim 23 of the '893 [12] patent. That's chart 60, 60(a) or 60(b).

[13] Mr. Shinskey, in your understanding [14] is Claim 23 dependent on Claim 19?

[15] **A:** Yes, it is.

[16] The Claim 23 states that it uses [17] Claim 19 as a basis, and simply is an additional [18] term to add to what the elements of claim 19 would [19] be.

[20] **Q:** And in your understanding, is Claim 23 [21] infringed by the APS 3200?

[22] **A:** No. Claim 23 would not be infringed if [23] Claim 19 were not infringed.

[24] **Q:** All right. Mr. Shinskey, looking at all

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[1] of the Honeywell patent claims that are being [2] asserted here and looking at how IGV position is [3] used in all of those claims, does inlet guide vane [4] position perform that same role in the APS 3200?

[5] **A:** No, it does not.

[6] **Q:** In the APS 3200, is there something else [7] that occupies that role that's required by IGV [8] position in the patent claims?

[9] **A:** The role of IGV in the patent claims is [10] to adjust the set point for the surge control [11] variable. And temperature plays that role in the [12] APS 3200.

[13] **Q:** With respect to an argument that the APS [14] 3200 does use inlet guide vane position in the [15] same way that the patents require and that the [16] 3200's use of temperature is just something extra [17] that can be ignored, do you have any opinion with [18] respect to that issue?

[19] **A:** The APS 3200 does not use guide vane [20] position in surge control. It simply is a [21] secondary test recognizing a high-flow condition [22] which locks out the surge control system or [23] maintains a locked out condition for the surge [24] control system.

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[1] It does not help in surge control at [2] all.

[3] **Q:** And how is temperature used in the APS [4] 3200?

[5] **A:** Temperature is used to adjust the set [6] point of the surge controller so as to maintain [7] the compressor out of surge as temperature [8] variations take place.

[9] **Q:** Okay. We are a going to turn now to the [10] question of whether the Honeywell patents are [11] valid in light of the prior art that has been [12] identified in this case.

[13] Mr. Shinskey, let me ask you, did [14] you consider the question of whether the Honeywell [15] patent claims that are at issue in the lawsuit [16] were either anticipated by or made obvious by what [17] was already known in the field of surge control [18] for compressors as of the time more than a year [19] before the Honeywell patent applications were even [20] filed?

[21] **A:** I did consider that, yes.

[22] **Q:** And what was your conclusion on that [23] question?

[24] **A:** My conclusion was that there were many

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[1] references of prior art that included all of the [2] elements that were claimed in the Honeywell [3] patent, and these — this prior art were [4] publications that predated the filing of the [5] application

for the Honeywell patents.

Q: Now, first of all, let's take a look at what the patent office itself found was already known in the field at the time the Honeywell patent applications were filed.

If you could, please, pull up chart No. 4.

Mr. Shinskey, could you explain what this chart shows with respect to what the patent office itself found was already known in the field of surge control?

A: Yes. On the left-hand side, we have Claims 48 and 49 from the application that was filed with the patent office. And these claims were not accepted by the patent office. And the claims that were allowed differed from the claims that were rejected on the basis that they had the provision for adjusting the set point of the surge controller or otherwise changing the output of the surge controller as a function of inlet guide vane

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position.

Q: Just to explain to the jury, looking at the language in Claim 4, the language that's not highlighted, what does that correlate to with respect to what we see in the left-hand column?

A: Well, all the other elements are essentially the same. You can even see the same language, for example, subparagraph A is the same in both cases.

So the only distinction of the addition of the feature of adjustable guide vanes and the use of adjustable guide vanes in effecting the controllers's output.

Q: Let me show you what's called the file wrapper for the '194 patent, that's Defendant's Exhibit 12, and if we could walk through what is reflected there in this Claim 4 chart.

MR. HERRINGTON: Your Honor, may I approach the witness?

THE COURT: Yes, you may.

BY MR. HERRINGTON:

Q: Mr. Shinskey, first of all, could you identify what Defendant's Exhibit 12 is?

A: Yes. This appears to be the file wrapper

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for the patent, and therefore, includes the examiners's comments and reasons for rejecting some of the claims and whatever amendments followed that.

Q: This is for the '194 patent? It even shows that in the top right corner of the first page?

A: Yes, it does.

Q: Why don't you turn to the page that has a Bates stamp number, HSB 401556.

A: I have that page.

Q: Looking at the claims that are numbered 48 and 49, does that correlate with what we've shown on chart four on the board there?

A: Yes. The wording in the file wrapper is the same as the wording that's on the screen.

THE COURT: The jury can't read it.

MR. HERRINGTON: Okay. We can make it bigger.

Is that better?

THE COURT: No, it's the size.

Q: Why don't we leave that up for a minute and let me ask you, what we have here on the left-hand side is Claim 48 as it was shown in a

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patent claim that Honeywell originally tried to obtain from the patent office, is that correct?

A: That's correct.

Q: And did the patent office allow that claim?

A: No, the patent office did not allow Claim 48.

Q: And before we move on, if we could focus on Claim 49. Is Claim 49 another claim that Honeywell tried to obtain from the patent office?

A: Yes, it is. Claim 49 depends on Claim 48, but it is rejected as well.

Q: The patent office — did the patent office allow that claim?

A: No, the patent office did not allow the claim.

Q: Why don't we turn to HSB 401565.

Could you identify what that is, please?

A: I believe this is what is called office action, where the patent examiner lists which claims were rejected, which are objected to, and so forth.

Q: Okay. Let me ask you to turn to the

Page 1430

second page of that document, and I'll read from the first — the second full paragraph. Let me ask you, what is shown by the second page?

A: In the second page are the reasons for rejecting the claims which the examiner rejected.

Q: And I'm going to try — we're going to try to project this onto the screen. While we're waiting for that, let me read what the patent examiner stated in this office action. He states, "Shell," and if you understand what that refers to, what does "Shell" refer to?

A: Shell is the international oil company that has a patent relevant to the art.

Q: It states: Shell discloses a compressor control system including surge control passage 9 with valve 10, P and delta P sensor, dividing circuit 14 and controller 15. Controller 15 compares the quotion with circuit 15 with set point 16. Note that the controller in figure two has both proportional and integral action.

What does that last sentence refer to?

A: The last sentence refers to the fact that Shell in their patent was, claimed proportional

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and integral control of the surge variable.

Q: And it goes on to state, "Moreover, Shell's system operate according to a method generally similar to that claimed."

Now, skipping over to the next page, the first full paragraph, we just referred to Claims 48 and 49 that Honeywell originally tried to obtain from the patent office, and here it states, "Claims 48 and 49 are rejected like claims 41 through 43 and 52 above in view of Louis. The Shell control system is obviously applicable to any dynamic compressor, including gas turbine driven compressor means such as those disclosed by Louis."

If you could please explain what you understand the patent examiner has stated here?

A: Well, the patent examiner says that the system as patented by Shell, the system —

MR. HERRINGTON: I'm sorry, we're not able to project this.

THE COURT: Is there — is this document available to the jury in the jury notebook?

MR. HERRINGTON: I believe it may be

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in the jury book.

THE COURT: Why don't you take a moment and see.

MR. HERRINGTON: All right. We'll take just a moment.

BY MR. HERRINGTON:

Q: What we're reading from is in Tab I of the jury notebook. And looking in

controls. Does [23] Warnock refer to using electronic equipment in the [24] surge control system?

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[1] **A:** Yes, he does. I believe this is — this [2] text follows the discussion on the reset windup [3] protection. If we could go back to the text that [4] has —

[5] **Q:** I think it's page 12.

[6] **A:** Yes. Right at the very top, the first [7] full paragraph at the top talks about, he has [8] developed this method or described this method for [9] protecting the proportional plus reset controller [10] against windup. That method is — he names the [11] batch switch.

[12] And so he says, "The batch switch [13] system is available on a number of pneumatic [14] controllers as an option, and a number of [15] electronic controllers as a standard feature."

[16] So he does address electronic surge [17] control systems.

[18] **Q:** Now, looking back at the, Mr. Warnock's [19] introduction to his article on the first page, [20] does he discuss the importance of matching a set [21] point of a surge control system with where the [22] surge point would be?

[23] **A:** Yes, I believe he does. I think it's [24] over here.

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[1] Now, he addresses here, and this is [2] quite important, he addresses the economy of the [3] system. And he says since bypassing or blowing [4] off gas waste power, it's desirable to determine [5] surge flow as accurately as possible to avoid [6] bypassing while maintaining safe operation.

[7] However, he says, this is not a [8] simple matter. Surge flow for compressors is not [9] a fixed quantity, but is related to other [10] variables. And I'm going to underline here other [11] variables.

[12] And among those variables, of [13] course, would be inlet guide vanes. And speedy [14] and so forth. And so where other variables [15] substantially affect surge flow, they must be [16] measured and included in the surge system, and [17] that's the role of inlet guide vanes when they [18] were variable.

[19] He goes on to say, surge conditions [20] can be defined completely in terms of variables [21] other than flow. But the problem of defining [22] surge conditions has led to the development of a [23] wide variety of systems.

[24] And of course he shows many examples

Page 1460

[1] of those systems in his paper.

[2] **Q:** I believe you already reviewed one of the [3] examples he shows is when a compressor has [4] adjustable guide vanes that the set point should [5] be adjusted based on the guide vane position?

[6] **MR. PUTNAM:** Objection, leading.

[7] **THE COURT:** Why don't you rephrase [8] it.

[9] **Q:** With respect to compressors that have [10] adjustable guide vanes, what does Mr. Warnock [11] show?

[12] **A:** Mr. Warnock's conclusion with adjustable [13] guide vanes, he uses the adjustable guide vanes to [14] set the set point of the surge controller and [15] therefore compensate for the guide vanes in their [16] affect on the location of the surge limit.

[17] **Q:** Now, Mr. Shinskey, we've talked about [18] Warnock disclosing data of the set point based on [19] inlet guide vane position, his reference to using [20] a flow-related parameter that would be to [21] temperature, to using, would an engineer of [22] ordinary skill read this article back in the late [23] 1970's be able to take what Warnock is describing [24] and implement it in a surge control system?

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[1] **A:** Yes, he could.

[2] **Q:** Why don't we turn to the White article, [3] that's Defendant's Exhibit 6. This is Tab N in [4] the jury book.

[5] Mr. Shinskey, if you could, please, [6] tell us the title of the article?

[7] **A:** Surge Control for Centrifugal [8] Compressors.

[9] **Q:** Do you recognize the author?

[10] **A:** Yes, the author, M.H. White was a member [11] of the Foxboro Company at the same time I was, and [12] at the time the article was prepared.

[13] **Q:** And if you could, please, tell us the [14] journal in which this article was published?

[15] **A:** This article appeared in Chemical [16] Engineering magazine. Chemical Engineering [17] magazine, a technical magazine which serves the [18] chemical industry and the light industries, [19] different — wherever chemical technology is used, [20] and food processing, paper mills, hydrocarbons and [21] so forth, Chemical Engineering magazine is used.

[22] And it also includes technical [23] articles on controlling those processes in all of [24] those industries.

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[1] **Q:** And are you familiar with generally the [2] circulation of this journal?

[3] **A:** It would be over 100,000, I would [4] believe. I have subscribed to Chemical [5] Engineering magazine for almost 50 years and some [6] of my articles have appeared in here as well.

[7] **Q:** Now, this particular article by [8] Mr. White, has this been cited in other [9] publications?

[10] **A:** Yes, in fact, Warnock does include White [11] as a reference in his article. And it is — this [12] article that he published here was — has been [13] used at the Foxboro Company as kind of a standard [14] for engineers in the work that they have done in [15] designing surge control for compressor.

[16] **Q:** I don't know if you mentioned yet, what [17] is the date of this article?

[18] **A:** December 25th, 1972.

[19] **Q:** That was before the that was before the [20] patents were applied for?

[21] **A:** Yes.

[22] **Q:** You reviewed the file wrapper for the [23] Honeywell patents. Was this article examined by [24] the patent office when they were considering the

Page 1463

[1] validity of the Honeywell patents?

[2] **A:** It is not among their references, no.

[3] **Q:** What is the subject of Mr. White's [4] article?

[5] **A:** Mr. White is trying to show engineers how [6] to design an efficient and safe surge control [7] system, again, for a variety of different [8] compressors.

[9] **Q:** Does he discuss surge control for [10] compressors that have adjustable inlet guide [11] vanes?

[12] **A:** Yes, he does.

[13] **Q:** Where is that?

[14] **A:** That's about four or five pages into the [15] paper.

[16] Yes, here it is. Inlet guide vanes [17] shown here. And he talks about constant speed [18] compressors which is, of course, the case in the [19] patent.

[20] **Q:** Let me just interrupt for a second. [21] That's page 60 of his article?

[22] **A:** Page 60.

[23] **Q:** Okay.

[24] **A:** Constant speed centrifugal and axial

Page 1464

[1] compressors being frequently equipped with [2] adjustable inlet guide vanes. So it appears right [3] here.

[4] And then he talks about addition [5] reply, axial compressors may have adjustable [6] stator blade, so he puts the stator blades of an [7] axial compressor into the same category inlet [8] guide vanes of a centrifugal compressor.

[9] He describes beside influencing the

[10] compressor output, moving these vanes also changes [11] the slope of the surge curve. There is a surge [12] line for each vane position, just as there is, for [13] example, for each inlet temperature.

[14] **Q:** Now, does Mr. White describe a system [15] where the set point is adjusted based on guide [16] vane position?

[17] **A:** Yes, he does. I believe it's his figure [18] nine that shows that. Now, figure nine, White [19] uses for two different purposes. And in his first [20] purpose, he describes automatic temperature [21] compensation for compressors where we are [22] compressing a gas over a very, very wide [23] temperature range.

[24] And in that case, if the temperature

Page 1465

[1] of the gas is variable, then White uses a [2] temperature measurement and sends that temperature [3] measurement into a calculation to adjust the set [4] point of the surge controller.

[5] Then he goes on after he's finished [6] with his discussion of temperature compensation, [7] he goes on to discuss what we do in the case of [8] inlet guide vane variation, and he uses the same [9] diagram to do double service here, so he doesn't [10] have to draw the diagram over again.

[11] And he replaces the temperature [12] input with IGV position, and he says the [13] functional relationship is quite similar, and in [14] this configuration, variations in the position of [15] the inlet guide vanes go on to adjust the [16] temperature — excuse me, adjust the set point for [17] the surge controller.

[18] **Q:** Does Mr. White's article provide a [19] description of what's shown in figure nine?

[20] **A:** Yes, the text immediately to the right of [21] figure nine on the same page I believe describes [22] that.

[23] He talks about, first of all, if we [24] don't put any compensation in for variable guide

Page 1466

[1] vanes, this could result in bypassing gas at times [2] when it is not required. And therefore, when [3] vanes are positioned from a manual station and not [4] frequently changed, it's possible to simply make [5] an adjustment manually.

[6] However, he says, when frequent [7] changes in vane position produce large variations [8] in the slope of the surge line, it is desirable to [9] make the changes in the setting automatically. [10] And then he goes on to say, using a system like [11] the one for automatic temperature compensation in [12] figure nine.

[13] So he says the signal for the [14] controller to the vane operator, which is an [15] indication of the position of the vane, instead of [16] temperature measurement, is fed into the analog [17] computer to adjust the ratio setting.

[18] Then he goes on to say, this [19] produces a linear relationship between the ratio [20] setting and the vane position that is not [21] precisely correct; however, the errors introduced [22] are usually small enough to be neglected.

[23] **Q:** Let me ask you about measuring the flow [24] parameter. Does White describe how to measure a

Page 1467

[1] flow parameter in the discharge side of the [2] compressor?

[3] **A:** Yes, he does. If we can back up, there [4] is a discussion on discharge line flow [5] measurement. Now, the discussion on discharge [6] line flow measurement begins on this page and [7] continues to the next page, but in the next page [8] he relates it specifically to the case — and [9] we've skipped a page here somehow.

[10] **Q:** Why don't I see if I can project it on [11] the Elmo.

[12] This is on page 61.61 doesn't have [13] a page number, but it's preceding 62.

[14] **A:** Can you lower it down just a little bit?

[15] Okay. This is the area of interest [16] right here. Can I still — can I still mark this [17] up, Stephanie? No. Okay.

[18] The paragraph that begins right in [19] the middle of the page here says, When the [20] compressor operates at constant speed, the [21] instrumentation can be further simplified, that [22] means we don't have to divide by temperature, [23] multiply by pressure and so forth.

[24] Under the condition the compress

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[1] ratio is constant at the search point and [2] therefore the equation 33 reduces to a simple [3] proportionality between a flow measurement made at [4] the inlet which produces a signal H1 and a flow [5] measurement made at the discharge of the [6] compressor which produces a signal H2.

[7] And therefore, we can use a standard [8] control system, simply replace H1 with H2.

[9] **Q:** Now, the Honeywell patents talk about [10] using proportional integral controls in a surge [11] control system. Does Mr. White in his article [12] discuss using proportional and integral controls?

[13] **A:** Yes, he does. It's under the heading of [14] Instrumentation. If we look at the second [15] paragraph here, he says the surge controller [16] should have in addition to proportional and reset [17] functions.

[18] **Q:** This is on page 58 of the article.

[19] **A:** And then he goes on, he goes on to [20] describe the need for windup protection, referring [21] to batch feature, which is the same terminology [22] that Warnock used in his system, in his paper.

[23] **Q:** Now, some of the Honeywell patent claims [24] refer to using electronic equipment, and does

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[1] Mr. White refer to that as well?

[2] **A:** Yes, he does. If we look at the first [3] paragraph under this heading of instrumentation, [4] he says that the equipment can be either pneumatic [5] or electronic.

[6] **Q:** Looking at all the features we've [7] discussed, adjusting the set point based on inlet [8] guide vane position, measuring a parameter in the [9] discharge side of the compressor, using PI control [10] for the surge control system, and using electronic [11] equipment, would an engineer of ordinary ability [12] working in the period a year before the Honeywell [13] patents were applied for, be able to take the [14] White article and implement a surge control system [15] that uses those features?

[16] **A:** Yes, definitely.

[17] **Q:** Do you have any knowledge of the White [18] article actually being used in that way?

[19] **A:** Oh, yes. The White article has been [20] used, again, by engineers at the Foxboro Company [21] to develop surge control systems.

[22] **Q:** Why don't we look at what's called the [23] Fallin article, that's our Exhibit No. 19. This [24] is Tab Q in the jury book.

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[1] Mr. Shinskey, if you could please, [2] read the title of the article?

[3] **A:** Controls for an Axial Turbo Blower.

[4] **Q:** Who are the authors?

[5] **A:** The authors are Fallin and Belas, [6] employees of the Bethlehem Steel Corporation at [7] the time the article was published.

[8] **Q:** When was this article published?

[9] **A:** May 1968 is the date.

[10] **Q:** And in what journal was it published?

[11] **A:** This article was published in [12] Instrumentation Technology, which is the Journal [13] of the Instrument Society of America, published [14] monthly.

[15] **Q:** If you'll turn one page you'll see where [16] that's shown a little bit lower on the screen.

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Hamilton Sundstrand

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in [21] Tucson before I graduated college and then once I [22] graduated I stayed on with them for a short time [23] thereafter.

[24] **Q:** And that AlliedSignal is what is now

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[1] known as Honeywell?

[2] **A:** Correct.

[3] **Q:** Did you, while during the —[4] approximately how long after graduating from [5] college were you at AlliedSignal?

[6] **A:** After I graduated, I probably was there [7] for a year.

[8] **Q:** And I take it you worked at Allied also [9] as a — while you were still a student in college?

[10] **A:** Correct.

[11] **Q:** At any point during your employment with [12] AlliedSignal in Tucson, Mr. Greubel, did you have [13] any role in designing or developing or [14] manufacturing their APU products?

[15] **A:** No.

[16] **Q:** What products of AlliedSignal's did you [17] work on, have a significant role in connection [18] with?

[19] **A:** Well, when I was a student engineer for a [20] period of my two years there, I worked in a [21] reliability group, so I wasn't really involved [22] with any kind of particular product. It was just [23] electronic controllers that I was helping out [24] with, database entry, printing out reports and

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[1] plotting data, things of that nature.

[2] After I graduated and went full-time [3] as a degree in engineering, I worked on a database [4] program for the electrical engineers. And I also [5] worked on primarily cabin pressure control systems [6] after that.

[7] **Q:** What are "cabin pressure control [8] systems," Mr. Greubel?

[9] **A:** It's basically a system that keeps the [10] pressure in an aircraft cabin comfortable so that [11] when you're going up to 40,000 feet your ears [12] don't pop. It just keeps the cabin at a [13] comfortable pressure.

[14] **Q:** Do those cabin pressure control systems [15] have anything to do with APUs?

[16] **A:** No.

[17] **Q:** I think you mentioned that when you were [18] a student employee and then perhaps later, you [19] also had some job responsibilities with entering [20] information in a database; is that right?

[21] **A:** Right.

[22] **Q:** And did you enter any information in a [23] database that had anything to do with APUs?

[24] **A:** No. They were just electronic components

Page 1715

[1] that might have found themselves into some APU [2] product way down the road, but it was nothing with [3] APUs.

[4] **Q:** Now, was any of the work that you did [5] while you were at what's now known as Honeywell [6] related in any way to controlling surge on an [7] auxiliary power unit?

[8] **A:** No, not at all.

[9] **Q:** Before you joined Sundstrand in the [10] summer of 1990, Mr. Greubel, did you have any [11] experience at all in designing or developing a [12] surge control system?

[13] **A:** No.

[14] **Q:** What led you to move from Tucson and work [15] at AlliedSignal to join Hamilton Sundstrand in San [16] Diego, California in the summer of 1990, [17] Mr. Greubel?

[18] **A:** Sundstrand was looking for engineers, and [19] I had grown up in Tucson and I had just graduated [20] recently. I decided I wanted to try something [21] different, live in a different area of the [22] country. I was still single, so I thought that [23] would be a good idea.

[24] Also AlliedSignal was having

Page 1716

[1] problems with layoffs and morale wasn't that good, [2] so it was kind of the two main reasons why I [3] decided to take the opportunity to move to San [4] Diego.

[5] **Q:** When you got to San Diego and joined [6] Sundstrand, do you recall the first project you [7] were assigned to?

[8] **A:** Yes, I was put on the APS 3200 program [9] and I was mainly cast with working with computer [10] programs, modeling of the control system and the [11] engine for the APS 3200.

[12] **Q:** At some point were you asked to work on [13] the development of the surge control system being [14] developed for the APS 3200?

[15] **A:** Yes.

[16] **Q:** And approximately when did that happen?

[17] **A:** Probably within a few months after [18] starting there.

[19] **Q:** So sometime in 1990?

[20] **A:** Yeah.

[21] **Q:** Now, today, are you generally familiar [22] with how the surge control on the APS 3200 has [23] worked for the period at least since February 3rd, [24] 1999?

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[1] **A:** Yes.

[2] **Q:** Now, going back to the fall of 1990,— [3] withdrawn, let me ask you another question.

[4] Today, do you have responsibilities [5] for the 3200 or have you been assigned to other [6] products?

[7] **A:** No, I have other programs now.

[8] **Q:** But back in 1990 when you were first [9] asked to start helping out on developing the surge [10] control system for the APS 3200, at that point had [11] Hamilton Sundstrand determined whether to have a [12] single or varying set point for the surge control [13] logic?

[14] **A:** No.

[15] **Q:** And had it decided at that point to vary [16] the set point in accordance with air inlet [17] temperature?

[18] **A:** No.

[19] **Q:** Had it decided at the point you were [20] asked to join the team to use proportional and [21] integral controls?

[22] **A:** That would have been decided already. [23] That's a simple control loop, so that would have [24] been in place already.

Page 1718

[1] **Q:** At the point in 1990 that you first [2] started working on developing the surge control [3] logic, had Hamilton Sundstrand become aware that [4] there was a double-solution issue with respect to [5] the particular measurement of air in the [6] compressor?

[7] **A:** At the point that I started?

[8] **Q:** Yes.

[9] **A:** No.

[10] **Q:** And is it fair to say not having yet [11] identified that there was that double solution [12] issue, it hadn't yet figured out how to solve the [13] double-solution issue?

[14] **A:** Correct.

[15] **Q:** Had Sundstrand, at the time in 1990 when [16] you first started working on the surge control [17] system, decided to have a test of high flow versus [18] low flow as part of the overall system?

[19] **A:** Back when I started?

[20] **Q:** Yes.

[21] **A:** No, because we didn't know about the [22] double solution at that point.

[23] **Q:** And had it decided at that point what [24] logic should be used to determine whether the

Page 1719

[1] system was in high or low flow?

[2] **A:** No, again, because we didn't re-

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fringed.

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[1] So the key issue is the absence in [2] generating those PI control signals, the things [3] that control the surge valve of any input from IGV [4] position. It's not there in the 3200.

[5] Now, IGV position is relied upon in [6] another aspect of this overall system. And I'm [7] going to turn to that right now. But the patent [8] calls for using IGV position to generate the PI [9] control signals that are used to operate that [10] little exhaust valve.

[11] And perhaps I should step back a [12] moment and just review what has come out in the [13] testimony that inside this little compressor [14] that's whirling around and compressing the air for [15] use in the aircraft, if the demand for that air [16] falls, the air flowing through the compressor has [17] no where to go, and surge can occur.

[18] And therefore, to prevent that from [19] happening, the system automatically will open up [20] this valve. If the aircraft doesn't need the [21] compressed air that's being made and therefore the [22] flow inside the compressor is falling because it's [23] got no where to go, this valve is opened and [24] controlled by these PI signals, so it has

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[1] someplace to go, so that there is enough air [2] flowing through to prevent surge.

[3] And in the 3200, the PI control [4] signals control the operation of that valve to [5] prevent surge. They rely on the desired value, if [6] the parameter value coming in gets into this [7] range, if it's 89 degrees outside, and the [8] parameter value goes below .205, then you're going [9] to have a difference, and then you're going to [10] have a proportional integral control signal that [11] is going to open that valve a little bit, let some [12] air out.

[13] If there is a bigger difference, if [14] your parameter value is way below .205, you're [15] going to get a bigger error signal, it's going to [16] generate a larger signal in the end, the valve [17] will open more. That's what's going on.

[18] Let me turn to how the 3200 does use [19] IGV position. And if we could have the next [20] chart, Stephanie. Do you know which one it is? [21] Could you enlarge it for me?

[22] This is a separate part of the logic [23] that the APS 3200 uses. And what it signifies, [24] this is the — represents the high-flow test. And

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[1] you will recall from the testimony that this [2] particular parameter, DELPQP which has particular [3] characteristics, follows a curve where it doesn't [4] correlate perfectly with air flow in the [5] compressor.

[6] As flow increases, it goes up. As [7] flow continues to increase, it appears to go [8] down.

[9] Therefore the logic was developed to [10] say which side of that curve are we on so that the [11] system can know if the set point — if the [12] parameter value that's being reported is below the [13] set point, whether it's truly in a high-flow [14] situation, or a low-flow situation. You only need [15] to open your surge valve if you're really in low [16] flow.

[17] Because this particular parameter [18] has this, as Mr. Muller called it, this funny [19] characteristic that you can get a double solution, [20] that you can theoretically have a reading of a [21] parameter value of .18 when you are, in fact, [22] there is a lot of air going through this there.

[23] And you can also get a reading of [24] .18 when you're in low flow, because of that it

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[1] was understood to be a need to have a test to find [2] out if you had this value .18 whether you were in [3] low flow and needed to let your PI signals control [4] the valve or whether you were in high flow, in [5] which there was no need to have the PI signals [6] control the valve.

[7] So there are two parts of the test. [8] The first one, and it's written on this chart, and [9] again, there is no dispute that this is how it [10] works.

[11] If the value of the parameter goes [12] as high as .35, that's way above all those set [13] points, there is no concern at .35 that you're [14] anywhere near the surge limit. You don't have to [15] be, if there is that much movement in the air [16] going through the compressor, you don't have to be [17] opening your exhaust valve.

[18] So if the parameter value goes above [19] .35, this system cuts out those PI control [20] signals, and substitutes a separate signal that [21] everybody degrees, both experts agree is not a [22] proportional and integral control signal. It's [23] just a fixed voltage. And it keeps the exhaust [24] valve shut because you're in high-flow mode, you

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[1] don't have to be modulating or moving that exhaust [2] valve.

[3] And a separate test is built in that [4] involves IGV position, and it also involves [5] pressures and it involves temperature and it is a [6] back up test that if it's not greater than .35, [7] this test determines which side of that curve [8] you're on. Is it in high flow or is it in low [9] flow?

[10] And if it determines that it is in [11] high flow, all it does is it maintains this [12] constant signal, this non PI signal that's already [13] started to be generated once you got to the .35 [14] line, it just retains it.

[15] And if it determines that you're in [16] low flow, it then allows that — it then chooses [17] the PI signal to operate the surge control valve.

[18] The PI signals that then operate the [19] surge control valve, ladies and gentlemen, are the [20] same ones that are constantly being generated. [21] Regardless of how this test comes out and this [22] lock out of those signals, the PI signals that are [23] generated are the ones that are dependent on [24] temperature.

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[1] So the only role of IGV position in [2] this entire system is a back up test to determine [3] whether because of the funny characteristic of [4] this particular way to measure the air movement, [5] the machine is in high or low-flow mode.

[6] But there is nothing — if we could [7] put the language from Claim 4 back up there.

[8] What Claim 4 calls for, and Claim 8 [9] and Claim 19, is in generating the signals that [10] control the position of that valve and using [11] proportional and integral control signals, that [12] the magnitudes of those signals be affected under [13] the control logic by IGV position.

[14] And that simply does not happen in [15] the 3200. It's just not part of its design.

[16] And conversely, this high-flow test, [17] this back up high-flow test that does monitor IGV [18] position is no where in the patent. And that is [19] what this case is about. And you didn't hear a [20] word of this from Mr. Krupka.

[21] Mr. Krupka contented himself with [22] saying incorrectly that Mr. Shinskey admitted in [23] this courtroom that Claim 4D was satisfied by the [24] 3200. That is simply not the case.

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[1] Initially to support that [2] proposition, Mr. Schlaifer mistakenly put up a [3] snippet from somebody else's testimony entirely, [4] then when Mr. Putnam passed the note and [5] Mr. Shinskey's testimony was put up, you could see [6] that that testimony did not have Mr. Shinskey [7] saying yes, element 4D in the 3200, it adjusts the [8] PI signals in accordance with IGV position.

[9] In fact, during that part of the [10] cross-examination, I have no, ladies and [11] gentlemen, and if you focused on this as I did, [12] but in fact Mr. Putnam at that